CLAIMS

[1] A sound detecting mechanism comprising a pair of electrodes forming a capacitor on a substrate in which one of the electrodes is a back electrode forming perforations therein corresponding to acoustic holes and the other of the electrodes is a diaphragm,

characterized in that the diaphragm is made of a metal film or a laminated film, the metal film being formed by sputtering in a low temperature process, vacuum vapor deposition or plating technique, the laminated film being formed of an organic film(s) and a conductive film(s),

that the back electrode is formed on the substrate, and

that a spacer is formed from part of a sacrificial layer consisting of an organic film for determining a distance between the diaphragm and the back electrode.

[2] A sound detecting mechanism as claimed in Claim 1 characterized in that the diaphragm is made of an Ni film or Cu film formed by plating technique, and that stress of the diaphragm is controlled by setting processing conditions in executing the plating process.

[3] A sound detecting mechanism as claimed in Claim 1 characterized in that, by using the sputtering or vacuum vapor deposition technique, the metal film is made of one of Si, Al, Ti, Ni, Mo, W, Au and Cu, or formed by laminating a plurality of materials selected from Si, Al, Ti, Ni, Mo, W, Au and Cu, thereby to constitute the diaphragm.

[4] A sound detecting mechanism as claimed in Claim 1

characterized in that the diaphragm is formed of a lamination consisting of a base layer made of an organic film(s) using one of a resist, polyimide resin and polyparaxylene resin, and a conductive layer(s) made of a conductive material.

[5] A sound detecting mechanism as claimed in Claim 1 characterized in that the organic film of the sacrificial layer uses one of a resist and polyimide resin for forming a void area between the back electrode and the diaphragm by etching the sacrificial layer.

[6] A sound detecting mechanism as claimed in Claim 1 characterized in that the substrate is made of a monocrystal silicon substrate, and that a silicon substrate of (100) orientation is used as the monocrystal silicon substrate.

[7] A sound detecting mechanism as claimed in any one of Claims 1 to 6 characterized in that as a base for the sacrificial layer, a material having resistance to anisotropic etching may be used.

[8] A sound detecting mechanism as claimed in any one of Claims 1 to 6 characterized in that the sacrificial layer has a thickness of 1 to 5μm.

[9] A sound detecting mechanism as claimed in any one of Claims 1, 2, 5 and 6 characterized in that the diaphragm is formed of a plated layer formed by plating technique, and that a adhesion layer is disposed between the plated layer and an insulating layer formed on the substrate for enhancing adhesion.

[10] A sound detecting mechanism as claimed in any one of Claims 1

to 6 characterized in that an opening corresponding to a sound entrance is formed by anisotropic etching after the back electrode is perforated to form the acoustic holes.

[11] A sound detecting mechanism as claimed in any one of Claims 1 to 6 characterized in that the thickness of the back electrode is controlled by an inspection pattern juxtaposed to a sound detecting mechanism pattern on the silicon substrate.

[12] A sound detecting mechanism as claimed in Claim 1 characterized by further comprising a signal fetching circuit formed on the substrate and having a plurality of semiconductor elements, a sound detecting section formed of the diaphragm and the back electrode, and an electric connecting member for transmitting signals from the sound detecting section to the signal fetching circuit.

[13] A sound detecting mechanism as claimed in Claim 12 characterized in that the electric connecting member is formed of metal wires or a metal film formed on the substrate in a semiconductor manufacturing process.